KPDES FORM HQAA

Kentucky Pollutant Discharge Elimination System (KPDES)

High Quality Water Alternative Analysis

The Antidegradation Implementation Procedures outlined in 401 KAR 5:030, Section 1(3)(b)5 allows an applicant who does not accept the effluent limitations required by subparagraphs 2 and 3 of 5:030, Section 1(2)(b) to demonstrate to the satisfaction of the Environmental and Public Protection Cabinet that no technologically or economically feasible alternatives exist and that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the water is located. The approval of a POTW's regional facility plan pursuant to 401 KAR 5:006 shall demonstrate compliance with the alternatives analysis and socioeconomic demonstration for a regional facility. This demonstration shall also include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

I. Permit Information

Facility Name:	Middle Fork Development Corp	**KPDES NO.:**	KYG04 6340 (877-0191)
Address:	68 Elkins Fork Road	**County:**	Magoffin
City, State, Zip Code:	Hatfield, Kentucky 40154	**Receiving Water Name:**	Cow Creek

II. Alternatives Analysis - For each alternative below, discuss what options were considered and state why these options were not considered feasible.

1. Discharge to other treatment facilities. Indicate which treatment works have been considered and provide the reasons why discharge to these works is not feasible.

The 247.07 ac project area receives an average of 44.86 in of precipitation per year [a]. This amounts to an input of more than 820,000 gal of water per day.

Option 1.
The nearest treatment facility is Salyersville Water Works. It is 4 mi directly from the project area and 11 mi by road. At an estimated $20/ft, the cost of a pipeline to effectively pump water from the project area to Salyersville Water Works is $422,400 (4 mi*5280ft/mi=21,120ft.; 21,120ft*$20/ft=$422,400). Multiple pumping stations, estimated at $200,000 each, would also be required. The minimum estimated cost for this option would be $822,400 (pipeline cost $422,400+$200,000*2 stations=$822,400) making this option cost prohibitive and therefore very unfeasible.

Option 2.
Water removal via disposal trucks was also considered. This would require the purchase of trucks, associated maintenance costs, and drivers' salaries. The Freight Rate Index estimates these combined costs at $2.14 per mile[b], as of September 2009. One hundred and sixty-four trips per day (5,000 gal per trip) would be required to transport the water 22 mi (roundtrip) to Salyersville Water Works. The estimated cost per year would be $2,818,208 ($2.14/mi*22mi/trip=$47.08/trip; $47.08/trip*164/trips/day=$7,721.12/day; $7,721.12*365 days=$2,818,208.80) making this option cost prohibitive and therefore not feasible.

[a] http://mrcc.isws.illinois.edu/climate_midwest/historical/precip/ky/157134_psum.html
[b] http://wwwhst.com/freightrateindex/index_files/page0010.htm

Yes **No**

2. **Have Use of other discharge locations been evaluated?** ☒ ☐
(If yes, then indicate what other discharge locations have been evaluated and the reasons why these locations are not feasible.)

The Right Fork of the Middle Fork of Licking River, to the east of the site was evaluated as a possible discharge location. Discharge to this site would require the construction of a pipeline, an additional drainage basin, multiple pumping stations and collection ponds. The pipeline would be a minimum of one mile and cost approximately $105,600 (1 mi * 5,280ft/mile = 5,280ft * $20/ft = $105,600). The estimated minimum cost of two pumping stations ($200,000 each) would be $400,000. The minimum estimated cost for this option would be $505,600 ($105,600 pipeline + $200,000 * 2 pumping stations) making this discharge location economically unfeasible.

In addition, this stream is also considered a High Quality Water.

II. Alternatives Analysis - continued

3. **Water reuse or recycle.** Provide information about opportunities for water reuse or recycle at this facility. If water reuse or recycle is not a feasible alternative at this facility, please indicate the reasons why.

Reuse Opportunity 1
Approximately 20% of the input water mentioned in section II. 1. will be reused to provide water for dust control to help comply with the federal performance standards (20 CFR 816.95) that require all exposed areas of surface mining operations to be protected and stabilized to effectively control erosion and air pollution. This will be done by watering unpaved haul roads and disturbed/barren surfaces on the proposed mining operation.

Reuse Opportunity 2
The water will also be reused for hydroseeding to facilitate land reclamation. A total of 433,600 gal (3,200 gal/ac* 135.5 ac) will be required.

4. Alternative process or treatment options. Indicate what process or treatment options have been evaluated and provide the reasons they were not considered feasible.

Alternative Process 1: Underground mining
Underground mining was considered and eliminated because the configuration of the coal reserves. The seam thicknesses are insufficient or seams are too close together to allow for underground mining. This method would only recover approximately 65% of the total coal.

Alternative Process 2: Contour and Auger Mining
Contour and Auger Mining was considered but this would greatly reduce the recovery of coal from the project area. It would only recover 65 to 70% on the Lower Peach Orchard seam, 50% of the Upper Peach Orchard seam, and 65 to 70% of the Broaz Seam.

These alternative methods do not meet the applicant's needs, fail to maximize mineral recovery, and fail to satisfy the land/mineral owner commitments and are therefore not considered feasible.

Alternative treatments:
Limestone dosing was considered to treat the runoff in the ponds. Limestone dosing requires large amounts of limestone (approximately 10 lb per gal). The limestone would have to be shipped to the site, loaded into dump trucks and taken to the ponds. The process of limestone dosing creates a large

amount of calcium salts that precipitate into a sludge and cover the bottom of the ponds, thus reducing the effectiveness of the limestone remaining in the pond. Therefore, constant monitoring and maintenance is required. The ponds would have to be dredged and the limestone would have to be cleaned or replaced. Costs are estimated at approximately $200,000 per pond. This includes the cost of limestone, transportation of limestone, and cost of using dump trucks and dredges to apply limestone and remove calcium salt sludge, transportation and storage of calcium salt sludge, operators to operate and maintain the equipment, and water quality testing to ensure that the water chemistry coming off of the site is acceptable. In addition to the cost, limestone does not guarantee a safe result, it is easily coated by sludge and rendered ineffective, must be replaced regularly, and the results are unpredictable. Considering the costs associated with limestone dosing and the unpredictable results, this treatment is not a feasible alternative.

II. Alternatives Analysis - continued

5. On-site or subsurface disposal options. Discuss the potential for on-site or subsurface disposal. If these options are not feasible, then please indicate the reasons why.

Option 1
One option for on-site disposal is a site-specific sewage system. Six pumping stations would be required to pump water from the sediment ponds into the sewage system. With a total estimated cost of $1,200,000 ($200,000 per station*6), the pump station costs alone make this an unfeasible alternative.

Option 2
A septic and leach field system was considered, however the slope of the land is too great (4.4% to 11% in the streams, and 50% to 60% on the hillsides). This makes this system impossible to utilize and therefore an unfeasible alternative.

Option 3
A third option would be subsurface disposal; however there are no suitable locations for subsurface disposal within five miles of the project area. At a cost of $22/ft, a five-mile pipeline would cost $580,800 ($22/ft * 5280ft/mile * 5miles = $580,800). Therefore, if there was a suitable location beyond the 5 mi radius already considered, the minimum cost for the pipeline would make it an unfeasible alternative.

6. Evaluation of any other alternatives to lowering water quality. Describe any other alternatives that were evaluated and provide the reasons why these alternatives were not feasible.

Option 1: No Action
Existing conditions which include oil and gas production, timbering, and residential development within each of the respective watersheds in and adjoining the proposed mining operation, suggest existing water quality levels would probably not be maintained. Future actions such as oil and gas activities, timbering, silviculture, etc. are likely to negatively affect the water quality in the area. Additionally the loss of jobs (~55), indirect jobs (~100), taxes (at least $75,000 per year) and revenues related to this project would have negative economic and social effects.

Option 2: Accept More Stringent Water Limits
A second alternative would be to accept more stringent water limits which would require more effort to maintain. For example, changing the iron maximum requirement from 1.0 to 0.5 would require the continual addition of soda ash and lime. The cost of actively treating the water is substantially higher than passive treatment since the cost in labor alone can exceed $40,000 per year. Additional active treatments costs include chemical and water testing (calculated with AMDtreat4.0 http://amd.osmre.gov/).

III. Socioeconomic Demonstration

1. State the positive and beneficial effects of this facility on the existing environment or a public health problem.

Environmental Benefit: Sediment load reduction and stream channel stabilization
Past land use activities have impaired the effected streams. Pre-SMCRA mining consists of 71 acres in the permit area. Pre-SMCRA mining activities created an unstable fill and regular logging of the entire project area has caused erosion and increased sediment load in the stream. The construction of sediment control structures associated with this project will help remove the sediment load from the streams and the compensatory mitigation plan associated with this project will help stabilize the stream channel.

Socioeconomic Benefit 1: Additional employment opportunities in post-mining agriculture
After the project has been completed, the post mining land use plan proposes to create pasture land on the project area based upon commitment to the land owner. This will provide for agriculture opportunists to be established post mining. This post mining land use will potentially create additional jobs, income, and tax revenue. Additionally, the post mining land use plan will provide habitat for deer and turkey populations and increased recreational opportunities by increasing hunting opportunities.

Socioeconomic Benefit 2: Access to health care
There is a strong correlation worldwide between poor health and low income. By improving the economic condition of the area, access to adequate health care would increase. This may be done directly by providing health insurance to employees, and/or indirectly by providing income that would allow people to afford health insurance and/or adequate medical treatment.

2. Describe this facility's effect on the employment of the area

Data compiled by the US Department of Labor shows the unemployment rate of Magoffin County, KY at 10.3%. This is more that twice the national rate of 4.6% and it is much higher than the state wide rate of 5.7%. This proposed facility abuts an existing facility which is owned by the same company. Installation of this facility would potentially maintain approximately 55 direct jobs from the existing facility at an average of $45,000 per year. In addition to the direct employment, sub-contractors who provide various services to the facility will also receive economic benefits. Environmental consultants, engineering firms, logistics companies, mechanics, and blasting crews will all benefit from contracts associated with the project. Post-mining, the proposed project area will provide forestry and agriculture opportunities as well. In general, for every job maintained on the mining operation; one to two jobs are maintained through support services. Therefore, approximately 100 indirect jobs will be maintained by this project. Additionally, employees of the facility and sub-contractors will provide patronage to the local service industry.

3. Describe how this facility will increase or avoid the decrease of area employment.

The facility will not eliminate any existing jobs, and therefore it should not cause any decrease of employment in the area, but create approximately 10 new direct jobs. These 10 direct jobs will lower the unemployment rate by more than 0.2%. In addition to the direct employment, sub-contractors who provide various services to the facility (i.e. environmental consultants, engineering firms, logistics companies, mechanics, and blasting crews) will receive economic benefits. It can be assumed that for every direct job there will two indirect jobs. Therefore, approximately 20 indirect jobs will result from this project. Including the indirect jobs brings the unemployment rate down by 0.5%. Additionally, employees of the facility and sub-contractors will provide patronage to the local service industry.

4. Describe the industrial or commercial benefits to the community, including the creation of jobs, the raising of additional revenues, the creation of new or additional tax bases.

The facility will create approximately 10 direct jobs and 20 indirect jobs. This will decrease the unemployment rate by more than 0.2%. Local people spend the majority of their wages in the local area, therefore increasing the earnings of the local service industry. This will create additional tax revenues by increasing revenues in both personal income tax and sales tax.

When relating property taxes to the mining industry it has to be mentioned that, when land is being disturbed for mining use, the value of that property increases; therefore, increasing the taxable amount available. Different land sites command different tax levies. It is beneficial for state and local economies to have more active mining land, as that increases its value per acre, which increases tax revenues that benefit the local citizens. In many coalfield counties the tax rate on real property is highest for active mining land, with lower rates for land held in reserve, land with inaccessible reserves, and land already mined respectively. In addition, there will be over 1.2 million tons of coal recovered from the site that will garner substantial severance taxes – at least $75,000 per year.

5. Describe any other economic or social benefits to the community.

After the project has been completed, the post mining land use plan proposes to create approximately 240 acres of pasture land on the project area based upon commitment to the land owner. This will provide for agriculture opportunists to be established post mining. This post mining land use will potentially create additional jobs, income, and tax revenue. Additionally, the post mining land use plan will provide habitat for deer and turkey populations and increased recreational opportunities by increasing hunting opportunities. This would benefit the state by increasing sales in hunting supplies and taxes placed on them.

III. Socioeconomic Demonstration - continued

	Yes	No
6. Will this project be likely to change median household income in the county?	☐	☒
7. Will this project likely change the market value of taxable property in the county?	☒	☐
8. Will this project increase or decrease revenues in the county?	☒	☐
9. Will any public buildings be affected by this system?	☐	☒

10. How many households will be *economically* or *socially* impacted by this project?

Approximately 30 (10 direct employees, 20 indirect employees)

11. How will those households be *economically* or *socially* impacted? (For example, through creation of jobs, educational opportunities, or other social or economic benefits.)

Installation and operation of this facility will provide approximately 10 direct jobs at approximately $45,000 per year, providing a total influx of approximately $450,000 per year. Service providers to the facility (i.e. environmental consultants, engineering firms, logistics companies, mechanics, and blasting crews) will also receive economic benefits in the form of approximately 20 indirect jobs. In general, for every job created on the mining operation, one to two jobs are created through support services. Additionally, the employees of the facility and sub-contractors will provide patronage to the local service industry, thus generating revenue for the local service industry and increasing the amount of sales tax paid in the area that would go to local civic maintenance and improvements.

	Yes	No
12. Does this project replace any other methods of sewage treatment to existing facilities? (If so describe how)	☐	☒

	Yes	No
13. Does this project treat any existing sources of pollution more effectively? (If so describe how.)	☒	☐

Past land use activities have impaired the local streams. Pre-SMCRA mining consists of 71 acres of area in the permit area. Additionally, Pre-SMCRA mining activities created an unstable fill and regular logging of the project area has caused erosion and increased sediment load in the stream. The construction of sediment control structures will help remove the sediment load from the streams. Mitigation will take place as the mining project moves forward helping to stabilize the stream bank and reduce the sediment load.

III. Socioeconomic Demonstration - continued

	Yes	No
14. Does this project eliminate any other sources of discharge or pollutants? (If so describe how.)	☒	☐

Past land use activities have impaired the effected streams. Pre-SMCRA mining activities created an unstable fill and logging has caused erosion and increased sediment load in the stream. After completion of the mining activities, these sources of pollution will be fixed. Additionally, the implementation of the compensatory mitigation plan will provide 9,067 ft of stable stream that will provide protection to the watershed from future possible pollution sources.

15. How will the increase in production levels positively affect the socioeconomic condition of the area?

By increasing the county-wide production of coal, the facility will create approximately 10 direct jobs and 20 indirect jobs. This will decrease the unemployment rate by more than 0.5%. Local people spend the majority of their wages in the local area thereby increasing the earnings of the local service industry. This will create additional tax revenues by increasing revenues in both personal income tax and sales tax. In addition there will be over 1.2 million tons of coal recovered from the site that will provide at least $75,000 per year in severance taxes.

16. How will the increase in operational efficiency positively affect the socioeconomic condition of the area?

The mining activities will be done to achieve optimal recovery of available coal reserves within the proposed project area, and to provide mandatory sediment control and access in a safe, cost-effective and environmentally sound manner. This will provide an acceptable profit margin that would also benefit the employees by providing above average income ($45,000 compared to the county per capita of $18,867), support services by providing a need for engineering and consulting services, and local land owners by providing post mining land use that will increase their income potential.